



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/089,929

04/03/2002

William Crossland

3826.01 (AL1)

1238

7590

08/20/2004

Allston L Jones

Peters Verny Jones & Schmitt  
425 Sherman Avenue Suite 230  
Palo Alto, CA 94306-1840

EXAMINER

CHOWDHURY, TARIFUR RASHID

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 08/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/089,929

**Applicant(s)**

CROSSLAND ET AL.

**Examiner**

Tarifur R Chowdhury

**Art Unit**

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 31-54 is/are pending in the application.  
4a) Of the above claim(s) 51-54 is/are withdrawn from consideration.  
5) ☒ Claim(s) 39-43 is/are allowed.  
6) ☒ Claim(s) 31-34, 36, 37 and 44-50 is/are rejected.  
7) ☒ Claim(s) 35, 38 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 03 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Election/Restrictions***

1. Newly submitted claims 51-54 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Species I: claims 31-50;

Species II: claims 51-54.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 51-54 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Objections***

2. Claims 31, 34, 44, 45 and 48 are objected to because of the following informalities:

All of the above claims recite, "a single two dimensionally continuous layer". However, there is no two dimensional material/layer exist (it is always three dimensional because there is always going to be a thickness even it is very small e.g. 2 microns).

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**4. Claims 31-33 and 44-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Robinson et al., (Robinson), EP-A-0 878 729.**

5. Robinson discloses an optical device comprising an integrated multiphase spatial light modulator (SLM) (Figs. 7-9) for spatial phase modulation (col. 10, lines 13-17) of unpolarized light of a predetermined wavelength, the integrated spatial light modulator having a substantially planar liquid crystal layer (numeral 18 in Figs. 7-9), a layer reflective of the light of the wavelength (numeral 15 in Figs. 7-9) and a wave-plate layer providing an optical retardance of  $(2n + 1)\lambda/4$  (numeral 16 in Figs. 7-9 and col. 7, lines 5-9), wherein the LC layer has two opposed faces (Figs. 7-9) and being disposed and configured to provide an out of plane tilt in response to a voltage applied between the faces (Fig. 9 and col. 10, lines 5-11) and the liquid crystal layer (18) being spaced from the reflective layer (15) by the wave-plate layer (16), wherein the integrated SLM comprises an integrated array (col. 8, lines 53-56) of phase modulating elements (col. 10, lines 13-17) and voltage application circuitry (the implicitly present circuitry that provides the voltages V1-V3 in Fig. 9) for applying desired voltage across the LC layer whereby the LC layer has desired values of out of plane tilt (col. 10, lines 5-17); wherein the integrated multiphase SLM comprises an array of electrodes (the "reflecting addressing electrodes" 15 in Figs. 7-9 form an array of electrodes), each of the electrodes being associated with a respective portion of the liquid crystal layer to define the phase modulating element (see portions 40,41, 42 in Fig. 9), the electrodes being such that application of voltage to each electrode causes the portion of the liquid crystal

Art Unit: 2871

layer associated with the electrode to have a specific value of the out-of-plane tilt (see Fig. 9 and col. 10, lines 28-39) and wherein the voltage application circuitry is adapted to apply voltages to the array of electrodes (Fig. 9, col. 10, lines 28-39) for varying a deflection angle of light incident upon the array of phase modulating elements (col. 10, line 17).

Robinson also discloses (col. 12, lines 13-14) that other applications for phase modulators include beam steering.

Accordingly, claims 31, 45 and 48 are anticipated.

As to claims 32, 33, 46, 47, 49 and 50, Robinson also discloses (col. 7, line 13) that the liquid crystal layer is a nematic liquid crystal layer and that the liquid crystal layer is a pi-cell (col. 13, lines 17-26).

As to claim 44, Robinson also discloses (col. 1, lines 7-10; col. 2, lines 11-16; col. 4, lines 51-56 and col. 10, lines 15-17.) Therefore, since the method of routing the light beam on an array of phase modulating elements is merely a list of providing the element and applying the beam to the element, and each modulating element must be formed to make the device, the method would be inherent to the device.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**7. Claims 34, 36 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson as applied to claims 31-33 and 44-50 above and in view of Mears et al., (Mears), USPAT 5,930,012.**

8. As to claim 34, 36 and 37, Robinson differs from the claimed invention because he does not explicitly disclose a second integrated SLM being disposed with respect to the first SLM for receiving light from the first SLM to route the light.

Mears discloses in an example not drawn (see first example, col. 2, lines 7-17) an optical switch with two SLMs (this switch is the two SLMs version of the second example having the folded layout drawing in Fig. 4), wherein the switch comprises input and output optical fibers (col. 2, lines 27-32), two SLMs (col. 2, lines 12-17) onto which holograms are addressed for coupling selected inputs to selected outputs (col. 1, lines 62-67 and col. 5, lines 43-51).

Although the SLMs used in Mears are already polarization sensitive, it would

have been obvious to one of ordinary skill in the art to replace Mears transmissive SLM with the reflective SLM disclosed in Robinson because of the generally greater integration (through a better filling factor) achieved by reflective SLMs.

Accordingly, claims 34, 36 and 37 would have been obvious.

***Allowable Subject Matter***

9. Claims 39-43 are allowed.
10. Claims 35 and 38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Response to Arguments***

11. Applicant's arguments filed on 04/22/04 have been fully considered but they are not persuasive.

In response to applicant's argument that Robinson fails to disclose that the reflective layer is a single two dimensionally continuous layer, it is respectfully pointed out to applicant that Robinson discloses (col. 7, lines 39-40) that the electrode of all picture elements may comprise a continuous layer of conductor. Further, as pointed out by the applicant in relation to Fig. 10, Robinson discloses (col. 10, lines 44-46) that the positions of the "plane" electrodes 13 and the interdigitated electrodes 15 exchanged compared with Figs 7 and 9. Therefore, it is clear from the above disclosures of Robinson that the electrode 15 can be used as a continuous reflective layer.

Further, it is also pointed out to applicant that even considering the fact that Robinson only discloses interdigitated electrodes, it still reads on the limitation of "single

continuous layer" since a single part of the interdigitated electrode is indeed continuous and the claimed limitation does not limit that there is only one single continuous layer per pixel.

Therefore, the rejection was proper and thus maintained.

***Conclusion***

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (571) 272-2287. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TRC  
August 17, 2004

  
TARIFUR R. CHOWDHURY  
PRIMARY EXAMINER